JOURNAL OF APPLIED BEHAVIOR ANALYSIS 1987, 20, 329–333 NUMBER 4 (WINTER 1987)

THE FUTURE OF JABA: A COMMENT

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The appearance of Volume 20 of *JABA* encourages some reflections about the past two decades of applied behavior analysis. What changes have occurred during these 20 years? Where are we now and where do we seem to be going? Where *should* we go?

Over a span of 20 years one would expect some theoretical improvements as new relationships are discovered, new propositions are formulated, and principles are honed, modified, or discarded. It is also likely that new and more effective techniques are tried out and perfected. Together, these two developments should enable researchers to enter new areas—using different subjects, different settings, and different activities.

During the last 20 years, some critics of behavior theory and numerous detractors of applied behavior analysis have pointed to several major limitations (e.g., Schwartz & Lacey, 1982): Most subjects come from rather limited population segments, the study's setting frequently is one or another institution, and the activities themselves tend to be simple and often trivial. The critics may have had a point in the mid-1960s. Do they in the late 1980s?

To see what has happened during the last 20 years, let us consider the first issues of Volumes 1 and 20. Presumably they contain representative samples of research that is judged to be "good" by the scholarly community. I focus on three dimensions of applied behavior analysis that have occasioned considerable discussion over the years: the subjects, the settings, and the activities under investigation.

Table 1 lists the content of research articles, arranged by these dimensions, in the first issues of Volumes 1 and 20. One is arbitrarily labeled "yellow," the other "blue." Which of these issues appeared in 1968, and which in 1987? I have left the last line blank because it would give away the answer. The first issue of Volume 1 contains no references to previous *JABA* articles, of course, whereas Vol. 20 No. 1 contains 17 (21% of the total). This low percentage (compared to *JEAB*) is a good sign: We are still in close touch with the larger world!

The major subjective difference between the two issues is the general impression made on a reader. Vol. 1 No. 1 conveys a sense of adventure and great vigor as the researchers seem to marvel at the successes of their new procedures. The authors' infectious enthusiasm enlivens almost every page. Even simple methods (by today's standards) are described in loving detail and with zest. The message is: Look! This is what we did! And that is what happened! Isn't it wonderful? The tone of Vol. 20 No. 1 is calm and objective. The message is bland: We did this, and that happened.

The articles themselves provide few objective clues regarding their dates. Indeed, the "blue" and "yellow" issues summarized in Table 1 are difficult to tell apart. Certainly it is not immediately apparent that 20 years have intervened. There appear to have been few if any basic changes in the major dimensions of applied behavior analysis: We still concentrate on relatively simple (and sometimes important) problem activities (and deficits) of children and mental patients in various institutional settings. Such projects are entirely appropriate, of course; the results have been extremely beneficial for everyone concerned, and much useful knowledge has been accumulated.

But we are still far from achieving the potential of applied behavior analysis as envisioned in the 1960s, that is to modify significant activities in ordinary settings (Baer, Wolf, & Risley, 1968). Indeed, one gets the impression that applied be-

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Table 1
Major Dimensions of Research Articles

	"Blue" issue	"Yellow" issue
Subjects	48 normal children, aged 3–8 1 severely disturbed child 96 adult mental patients 3 normal adults	8 normal children, aged 7–10 5 disturbed youths 12 (severely) retarded adults 2 schizophrenics
Locations	1 mental hospital 4 schools etc. 3 ordinary life situations	4 mental hospitals 1 school 1 care center
Goals	reduce dangerous or irrelevant behavior perform actions relevant to situation	reduce inappropriate behavior perform simple tasks engage in appropriate actions
Length of study		
Range from: To:	1 hour each weekday for 6 weeks; unspecified daily amount for 50 days (with further observations).	65 to 120 trials over several days 1 hour per day for 26 weeks
Research articles	8	6
References	total: 83 to *JABA*: —	total: 81 to *JABA*: —

havior analysis is in something of a rut. No wonder that *JABA* appears to be in a rut as well (Bailey, 1987)! What are the underlying reasons for this? And how can we get out of this rut?

The answers reflect in large measure the field's self-imposed definitions of acceptable procedures and consequent narrow substantive focus. The rut has deepened over the years, and we will get out of it only by boldly venturing beyond today's methodological parameters. Applied behavior analysis can be considerably more than the endlessly repeated use of effective techniques to modify activities of individual children and patients. Such uses are laudable and necessary, and they may well remain central to applied behavior analysis. But—is this all there is, or can be?

It is time to transgress the limits of applied behavior analysis' childhood. In its own young adulthood, the pages of *JABA* can be instrumental in expanding the field's horizons far beyond simple actions and institutional settings, children and patients. Indeed, the actual boundaries of applied behavior analysis have yet to be determined. Staking them will require considerable time, much effort by many researchers, and a large number of studies. *JABA* is the ideal instrument for encouraging and coordinating this intellectually and practically significant work.

By venturing beyond today's parameters the benefits of applied behavior analysis will become available to a much larger segment of the population. Furthermore, many of the serious questions that have arisen during the last 20 years can then be addressed, for their answers lie beyond today's boundaries. Here I will mention only 10:

1. Are the principles that underlie applied behavior analysis cross-culturally valid?

2. Are these principles trans-historically valid?

On both theoretical and philosophical grounds many practitioners would say "yes" (and might even bet considerable sums). During the last 20 years, enough studies have been performed in areas other than North America so that we can answer the first question with a confident "yes." For obvious reasons, the second question has received much less attention. Similar questions might be raised about the techniques derived from these principles.

Other questions have become significant largely because of the great successes of applied behavior analysis. Their answers will have interesting im-

plications for the underlying principles and their future applications.

3. How arduous can the activities subject to applied behavior analysis be?

4. How complex can the activities subject to applied behavior analysis be?

5. How difficult can the activities subject to applied behavior analysis be?

6. How vital to the individual can the activities subject to applied behavior analysis be?

7. What is the time scale within which activities are subject to applied behavior analysis?

8. To what extent can applied behavior analysis occur outside the laboratory and institutional setting?

9. Must those who practice applied behavior analysis be specially trained in the use of relevant procedures?

10. Must those who practice applied behavior analysis be aware of behavioral principles?

So far, few systematic efforts to answer these questions have appeared in *JABA* (or elsewhere). The major problem is the very limited time scale of most studies; there are a few exceptions, such as Achievement Place. Short time scales, in turn, arise in large part from the self-imposed requirement that applied behavior analyses hew as closely as possible to classic laboratory procedures.

Questions 3 through 8 are difficult if not impossible to answer when the time frames of studies are so short, relative to daily life. I have included the time dimension in Table 1 to show that most studies do not last very long. Indeed, it is sometimes difficult to determine a study's length, a clear indication that time is not considered a significant variable. But time does matter. Time scales are especially important in the modification of arduous, difficult, and complex activities that are vital to an individual's life (either intrinsically or because of their consequences). There are several reasons for the critical nature of time scales. First, such behaviors probably have a long history—their performance is likely to have been reinforced by significant events many times over a long period. Second, these activities are not likely to be greatly influenced by other people's predictions and promises, or by cognitive processes such as modeling. Rather, they are probably more affected by a person's own experiences of new contingencies. Third, the new consequences will probably have to occur many times. Fourth, arduous, difficult, complex, and vital activities are usually affected by serial contingencies, many of which lie in the perhaps distant future. Finally, the new contingencies, to be effective, will have to be themselves significant, and this in turn probably requires a relatively long time span.

Consider two examples from the "blue" and "yellow" issues. It usually does not matter much to a third grader whether or not he or she pays attention in a classroom. The child's history includes many occasions on which he or she was attentive and many on which he or she was not. Both sets of these relatively easy and simple behaviors are within the child's repertoire. No wonder that properly managed contingencies can quickly produce great changes in the activities' frequency and duration. Whether or not a mental patient goes on a walk, when that simple and easy behavior has frequently occurred in the recent past, is not likely to be a significant aspect of the person's life; it is not related to food, clothing, shelter, or other recreational activities. Properly managed contingencies, then, should affect that behavior rather quickly and effectively.

But what about a Peruvian peasant whose life and family depend on the annual potato crop? Under what conditions will he engage in the complex, arduous, and difficult activities involved in the use of fertilizer, new seeds, and more effective cultivation methods? What contingencies do we manage here, and how? We should certainly expect at least a 2-year time frame. The actual number of harvests necessary to firmly establish the activity set "new agricultural methods" will depend on several factors, including the number and kind of available models, the variability in climate, and the activities collectively known as the community's "conventional wisdom."

In sum, it appears that trivial activities can be changed with trivial contingencies within a trivial time scale. More generally, we can formulate the

hypothesis that the more significant the activities are for the individual, the more important the contingencies will have to be for the individual, and the longer the required time scale of the project is likely to be. We would hypothesize similar relationships for activities that are difficult, complex, and arduous for the individual.

Tests of these hypotheses will expand the parameters of applied behavior analysis and lead practitioners into new areas. Activities and settings that are part of daily life, and subjects who are normal adults enmeshed in their own existence, can now become the focus of systematic investigation. Such studies will have far-reaching implications for a wide range of social policies and programs. *JABA* is the perfect place for reporting these studies and for coordinating the development of valid propositions and effective techniques.

Studies of significant, complex, difficult, and arduous activities of normal human beings of all ages leading ordinary lives do not necessarily require book-length reports. To return to our hypothetical Peruvian peasant, a *JABA*-type article would include the usual graphs with "number of agricultural innovations" along the ordinate and "number of planting seasons" along the abscissa. The modification of significant, arduous, difficult, and complex activities occurs mainly in real life and in real time, so to speak, and perhaps only there. Indeed, whether it does or does not (and the degree to which it does) are questions to be examined empirically. Again, *JABA* is the perfect place for reporting such examinations.

The exploration of such new areas requires two major changes in existing procedures: (a) The time scales of applied behavior analyses will be considerably longer than those now in vogue. (b) We will have to leave the conventional laboratory or institutional setting with its ready subject pool, effective controls, and easily managed activities. But we must retain the experimental paradigm as an effective means for testing hypotheses. Furthermore, we must continue to use experimental designs as the basis for organizing a study's procedures. After all, both have served the profession and its clients very well. Ethical questions, however, are likely to loom large in any study of complex, arduous, difficult, and significant activities. Both the goal and the procedures of applied behavior analysis will probably be very carefully scrutinized by various outsiders, and may well be deemed unacceptable. Values and politics are likely to come into play. How, then, can we answer Questions 3 through 10 and determine the inherent parameters of applied behavior analysis?

Many human events occur in sequences that can be viewed as natural experiments (e.g., Campbell, 1969). Real life, both today and in the past, in our society and in other cultures, offers many and varied opportunities to observe large-scale applied behavior analyses in the form of natural experiments. The rigorous standards to which readers of *JABA* are accustomed need not be compromised, for many natural experiments follow the experimental paradigm rather closely—if we make the effort to discover all of the relevant data. Indeed, it is advisable to consider only those natural experiments that follow the experimental paradigm and provide enough information to yield all of the required data. Researchers, however, must have a somewhat broader view of what constitutes "acceptable" procedures and data.

Initially, at least, natural experiments with adequate time scales and sufficient data will probably be the major sources of provisional answers to the questions raised earlier. The discovery of such natural experiments, together with the gathering and analysis of data, is not likely to require more of a researcher's time than do the studies presently reported in *JABA*.

Such natural experiments do considerably more than provide preliminary answers to the above questions. From them we will also learn how to design effective applied analyses of significant, arduous, difficult, and complex behaviors. Furthermore, such natural experiments will indicate which external factors must be considered, and what needs to be done about them. Laboratory and institutional settings generally do not require much attention to external constraints once the experiment is running. But large-scale long-term interventions typically do, because the external restraints (usually of an eco-

nomic or political nature) are likely to change over time.

Natural experiments can tell us about variables, principles, and procedures, but their message cannot be definitive. Too many (perhaps unknown) factors besides the observer-attributed determinants may be at work. Hence replications in which independent variables are managed by the experimenter may well be necessary.

Two recent descriptions of natural experiments illustrate the wide range of possibilities of applied behavior analysis. The Vicos Project was concerned with arduous, difficult, and complex activities significant to peasants living on a Peruvian hacienda (Kunkel, 1986). From 1952 to 1957 a small group of anthropologists and others managed new contingencies for new agricultural and communal activities of several hundred families in an Andean village. The project was very successful, as indicated by the peasants' purchase of the hacienda in 1962 and continued independence since then.

A good historical illustration of applied behavior analysis is the rise and fall of conservatories in some orphanages of 18th-century Venice (Kunkel, 1985). For example, Antonio Vivaldi wrote much of his music for the teen-aged girls in the orphanage where he was violin teacher. Through differential reinforcement, the complex, arduous, and difficult behavior sets involved in musical performances of concert quality were established and maintained in essentially a random sample of young girls. After about 50 years, the musical activity sets extinguished when their positive contingencies were eliminated by the orphanages due to economic difficulties.

These two natural experiments suggest that complex and difficult, arduous and significant activities of many individuals can be modified through the systematic long-term application of behavioral principles. Furthermore, these events provide some intriguing clues regarding Questions 9 and 10.

From classic studies we know that there is a wide range of potential "behavioral engineers" (e.g., Ayllon & Michael, 1959). But what are the limits? The people who designed and ran the music programs at the Venetian orphanages in the early 1700s obviously were unaware of behavioral principles as we know them today and had no training in the procedures of applied behavior analysis. The anthropologist Allan Holmberg was familiar with Hull's theory, but neither he nor the outsiders who worked on the Vicos hacienda were trained practitioners of applied behavior analysis.

The data sources for these two studies are publications in anthropology and music history, fields which at first glance have little to do with the systematic application of behavioral principles. Both, however, are treasure troves. Finding natural experiments in various human events of other times and cultures can be as much an intellectual adventure as the designing of ingenious laboratory studies.

(By the way, "blue" is Volume 1; "yellow" is Volume 20.)

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Received June 2, 1987
Revision received August 11, 1987
Final acceptance August 14, 1987
Action Editor, Jon S. Bailey